

CLAIMS

What is claimed is:

1. A non-intumescent mat for providing support for a fragile structure in a low temperature exhaust gas treatment device comprising high temperature resistant, amorphous, inorganic fibers, said fibers having a Young's Modulus of less than about 20×10^6 psi and a geometric mean diameter less than about $5 \mu\text{m}$, said mat optionally including a binder, wherein the mat is adapted to provide a holding force of at least 15 psi throughout an average mat temperature range from ambient temperature up to at least about 350°C .
2. The mat of claim 1, wherein the fiber is at least one of an amorphous alumina/silica fiber, an alumina/silica/magnesia fiber, mineral wool, E-glass fiber, magnesia-silica fiber, and calcia-magnesia-silica fiber.
3. The mat of claim 2, wherein the alumina/silica fiber comprises the fiberization product of a melt having from about 45% to about 60% Al_2O_3 and about 40% to about 55% SiO_2 .
4. The mat of claim 2, wherein the alumina/silica fiber comprises the fiberization product of a melt having about 50% Al_2O_3 and about 50% SiO_2 .
5. The mat of claim 1, wherein the fiber is E glass.
6. The mat of claim 1, wherein the fiber is magnesia-silica fiber.
7. The mat of claim 1, wherein the fiber is calcia-magnesia-silica fiber.
8. The mat of claim 1, wherein the mat is substantially free of binder.
9. The mat of claim 1, wherein the binder comprises a silicone latex.
10. The mat of claim 1, wherein the mat is formed with a binder comprising an acrylic latex which is burned out prior to operation.
11. The mat of claim 1, wherein the fiber contains less than about 40% shot.

12. The mat of claim 11, wherein the fiber contains less than about 30% shot.
13. The mat of claim 1, wherein the mat has a basis weight of from about 1000 to about 3000 g/m².
14. The mat of claim 1, wherein the mat has an installed density of from about 0.40 to about 0.75 g/cm³.
15. The mat of claim 1, wherein the mat has a nominal thickness of from about 4.5 to about 13mm.
16. The mat of claim 1, wherein the mat is one of a needle punched inorganic fiber blanket, a knitted glass fabric, and a woven glass fabric.
- 10 17. An exhaust gas treatment device containing a support element, wherein said support element comprises the mat of claim 1.
18. An exhaust gas treatment device according to claim 17, wherein the device is a catalytic converter for use with a turbocharged direct injection diesel engine.
- 15 19. An exhaust gas treatment device according to claim 17, wherein the mat is one of a needle punched inorganic fiber blanket, a knitted glass fabric, and a woven glass fabric.
20. An exhaust gas treatment device according to claim 17, wherein the mat contains a binder which is a silicone latex.
- 20 21. An exhaust gas treatment device containing a fragile support structure within a housing, and a support element disposed between the fragile support structure and the housing, wherein said support element comprises a non-intumescent mat comprising high temperature resistant, amorphous, inorganic fibers, said fibers having a Young's Modulus of less than about 20x10⁶ psi and a geometric mean diameter less than about 5μm, and said mat
- 25

optionally including a binder, and wherein the mat is adapted to provide resistance to slippage of the support element in the housing at a force of at least about 60 times the acceleration of gravity throughout an average mat temperature range from ambient temperature up to at least about 350°C.

- 5 22. The exhaust gas treatment device of claim 21, wherein the fiber is at least one of an amorphous alumina/silica fiber, an alumina/silica/magnesia fiber, mineral wool, E-glass fiber, magnesia-silica fiber, and calcia-magnesia-silica fiber.
- 10 23. The exhaust gas treatment device of claim 21, wherein the alumina/silica fiber comprises the fiberization product of a melt having from about 45% to about 60% Al_2O_3 and about 40% to about 55% SiO_2 .
24. The exhaust gas treatment device of claim 22, wherein the alumina/silica fiber comprises the fiberization product of a melt having about 50% Al_2O_3 and about 50% SiO_2 .
- 15 25. The exhaust gas treatment device of claim 21, wherein the fiber is E glass.
26. The exhaust gas treatment device of claim 21, wherein the fiber is magnesia-silica fiber.
27. The exhaust gas treatment device of claim 21, wherein the fiber is calcia-magnesia-silica fiber.
- 20 28. The exhaust gas treatment device of claim 21, wherein the mat is substantially free of binder.
29. The exhaust gas treatment device of claim 21, wherein the binder comprises a silicone latex.

30. The exhaust gas treatment device of claim 21, wherein the mat is formed with a binder comprising an acrylic latex which is burned out prior to operation.
- 5 31. The exhaust gas treatment device of claim 21, wherein the fiber contains less than about 40% shot.
32. The exhaust gas treatment device of claim 31, wherein the fiber contains less than about 30% shot.
33. The exhaust gas treatment device of claim 21, wherein the mat has a basis weight of from about 1000 to about 3000 g/m².
- 10 34. The exhaust gas treatment device of claim 21, wherein the mat has an installed density of from about 0.40 to about 0.75 g/cm³.
35. The exhaust gas treatment device of claim 21, wherein the mat has a nominal thickness of from about 4.5 to about 13 mm.
- 15 36. The exhaust gas treatment device of claim 21, wherein the mat is one of a needle punched inorganic fiber blanket, a knitted glass fabric, and a woven glass fabric.